

WHAT IS CLAIMED IS:

1. A method for defect inspection of a phase shifting mask, comprising:

5       injecting light beams having a predetermined light beam intensity into at least a first and a second light beam penetrating portions of the phase shifting mask;  
      reflecting the light beams having penetrated the light beam penetrating portions, by use of reflecting means, to  
10   cause the light beams to again penetrate through the light beam penetrating portions; and

      comparing the intensities of the light beams having again penetrated the light beam penetrating portions to detect defects of the phase shifting mask.

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2. A method for defect inspection of a phase shifting mask, comprising:

      a first step of injecting light beams having a predetermined light beam intensity into a first and a second  
20   light beam penetrating portions having a first phase of the phase shifting mask, reflecting the light beams having penetrated the light beam penetrating portions, by use of reflecting means, to cause the light beams to again penetrate through the light beam penetrating portions; and  
25   comparing the intensities of the light beams having again penetrated the light beam penetrating portions to detect defects of the phase shifting mask; and

a second step of injecting the light beams into a third and a fourth light beam penetrating portions having a second phase of the phase shifting mask, reflecting the light beams having penetrated the light beam penetrating portions, by  
5 use of reflecting means, to cause the light beams to again penetrate through the light beam penetrating portions; and comparing the intensities of the light beams having again penetrated the light beam penetrating portions to detect defects of the phase shifting mask.

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3. The method for defect inspection of a phase shifting mask according to claim 2, wherein the first step and the second step are alternately repeated.

15 4. The method for defect inspection of a phase shifting mask according to claim 3, wherein operation of the alternate repeating is a move of the phase shifting mask or a move of the light beam having the predetermined intensity.

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5. The method for defect inspection of a phase shifting mask according to claim 2, wherein the first phase is  $0^\circ$  and the second phase is  $180^\circ$ .

25 6. A method for defect inspection of a phase shifting mask, comprising:

a first step of causing a light beam having a

predetermined light beam intensity to penetrate through a normal portion having a first phase of the phase shifting mask, reflecting the light beam having penetrated the penetrating portion, by use of reflecting means, to cause  
5 the light beam to again penetrate through the normal portion having the first phase, and measuring in advance the intensity of the light beam having again penetrated as a reference intensity; and

a second step of causing the light beam to penetrate  
10 through a defect uninspected portion having the first phase, reflecting the light beam having penetrated the uninspected portion, by use of reflecting means, to cause the light beam to again penetrate through the uninspected portion, and comparing the intensity of the light beam having again  
15 penetrated through the uninspected portion with the reference intensity, to thereby detect defects.

7. An apparatus for defect inspection of a phase shifting mask, having;  
20 an optical system which includes;  
a light source having a predetermined light beam intensity;  
a light beam injecting unit for injecting a light beam from the light source into a light beam penetrating portion  
25 of the phase shifting mask;  
a light beam reflecting unit for reflecting the light beam having penetrated the light beam penetrating portion,

to cause the light beam to again penetrate through the light beam penetrating portion; and

a light beam detection unit for detecting the intensity of the reflected light beam; wherein

5 the apparatus comprising a comparing circuit for comparing the detected intensities of the light beam.

8. The apparatus for defect inspection of a phase shifting mask according to claim 7, wherein the apparatus is provided  
10 with at least two systems of the light beam injecting unit, the light beam reflecting unit and the light beam detection unit.

9. The apparatus for defect inspection of a phase shifting  
15 mask according to claim 7, wherein the light beam detection portion comprises an image detecting device and an image amplifying circuit.

10. The apparatus for defect inspection of a phase shifting  
20 mask according to claim 7, wherein the apparatus is provided with a single system of the light beam injecting unit, the light beam reflecting unit and the light beam detection unit.